AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on page 2, line 26 and ending on page 3, line 5 with the following amended paragraph.

In general, the methods involve introducing a sample solution containing the analyte of interest into the extraction channel in a manner that permits the analyte to interact with and adsorb to an extraction surface coating the surface of the channel. The adsorbed analyte is then eluted in a desorption solution. Optionally, the extraction channel is washed one or more times prior to introduction of the desorption solution. The desorbed analyte can be collected, and is typically analyzed by any of a number of techniques, some of which are described in more detail below. The extraction process generally results in the enrichment, concentration, and/or purification of an analyte or analytes of interest~~, e.g., a syringe pump~~.

Please replace the paragraph beginning on page 53, lines 16 – 27 with the following amended paragraph.

The use of gradients is well known in the art of chromatography, and is described in detail, for example in a number of the general chromatography references cited herein. As applied to the extraction channels of the invention, the basic principle involves adsorbing an analyte to the extraction surface and then eluting with a desorption solvent gradient. The gradient refers to the changing of at least one characteristic of the solvent, e.g., change in pH, ionic strength, polarity, or the concentration of some agent that influences the strength of the binding interaction. The gradient can be with respect to the concentration of a chemical ~~that~~ entity that interferes with or stabilizes an interaction, particularly a specific binding interaction. For example, where the affinity binding agent is an immobilized metal the gradient can be in the concentration of imidazole, EDTA, etc. In some embodiments, the result is fractionation of a sample, useful in contexts such as gel-free shotgun proteomics.

Please replace the paragraph beginning on page 54, lines 1 – 14 with the following amended paragraph.

Gradients used in the context of the invention can be ~~or~~ step. Step elutions are particularly applicable, particularly when segments of desorption solvent bounded by air and/or some other immiscible fluid are employed. In one embodiment, two or more plugs of desorption solvent varying in one or more dimension are employed. For example, the two or more plugs can vary in pH, ionic strength, hydrophobicity, or the like. The segment can have a volume greater than the capillary or less, i.e., a tube enrichment factor of greater than one can be achieved with each plug. Optionally, the capillary can be purged with gas prior to introduction of one or more of the desorption solvent plugs. In one embodiment, the plugs are introduced and ejected from the same end of the capillary. The plug is passed back and forth through the column one or more times. As described elsewhere herein, in some cases the efficiency of desorption is improved by lowering the flow rate of desorption solvent through the capillary and/or by increasing the number of passages, i.e., flowing the solvent back and forth through the capillary.

Please replace the paragraph beginning on page 58, lines 8 – 25 with the following amended paragraph.

In another embodiment, the extraction capillaries of the invention can be used as a tool to analyze the nature of the complex. For example, the protein complex is desorbed to the extraction surface, and the state of the complex is then monitored as a function of solvent variation. A desorption solvent, or series of desorption solvents, can be employed that result in disruption of some or all of the interactions holding the complex together, whereby some subset of the complex is released while the rest remains adsorbed. The identity and state (e.g., post-translational modifications) of the proteins released can be determined often, using, for example, MS. Thus, in this manner constituents and/or sub-complexes of a protein complex can be individually eluted and analyzed. The nature of the desorption solvent can be adjusted to favor or disfavor interactions that hold protein complexes together, e.g., hydrogen bonds, ionic bonds, hydrophobic interactions, van der Waals forces, and covalent interactions, e.g., disulfide bridges. For example, by decreasing the polarity of a desorption solvent hydrophobic interactions will be weakened- inclusion of reducing agent (such as mercaptoethanol or dithiothrietol) will disrupt disulfide bridges. Other solution variations would include alteration of pH, change in ionic strength, and/or the inclusion of a

constituent that specifically or non-specifically affects protein-protein interactions, or the interaction of a protein or protein complex with a non-protein biomolecule.